CLAIMS

1. A method of controlling the operation of hybrid power system having a fuel cell and a charge carrier for supplying power to a load, comprising the steps of:

(A) determining the state of charge of the charge carrier;

(B) setting the power output of the charge carrier to a first value if the power required by the load is less than the maximum power available to be supplied from the fuel cell; and,

(C) setting the power output of the charge carrier to a second value if the power required by the load is equal to or greater than the maximum power available to be supplied from the fuel cell.

2. The method as set forth in claim 1, including the step of determining power required by the load.

3. The method as set forth in claim 1, wherein steps (A)-(B) are repeated in a manner to maintain the state-of-charge of the charge carrier within a preselected range.

4. The method as set forth in claim 1, wherein the first value is determined based on at least the maximum voltage of the fuel cell, and the nominal state-of-charge of the fuel cell.

5. The method as set forth in claim 1, wherein the second value is determined based on the lumped system load power and the maximum power available to be supplied by the fuel cell.

6. The method as set forth in claim 4, wherein the second value is determined based on the lumped system load power and the maximum power available to be supplied by the fuel cell.

7. For use in a hybrid power system having a fuel cell and a charge carrier for supplying power to a load, a method of maintaining the state of charge of the charge carrier within a preselected range and optimizing use of the fuel cell, comprising the steps of:

(A) determining the state-of-charge of the charge carrier; and,

(B) based on the state-of-charge determined in step (A),

(i) setting the power output of the charge carrier to a first value if the power required by the load is less than the maximum power available to be supplied from the fuel cell; and,

(ii) setting the power output of the charge carrier to a second value if the power required by the load is equal to or greater than the maximum power available to be supplied from the fuel cell.

8. The method as set forth in claim 7, wherein the first value is determined based on at least the maximum voltage of the fuel cell, and the nominal state-of-charge of the fuel cell

9. The method as set forth in claim 7, wherein the second value is determined based on the lumped system load power and the maximum power available to be supplied by the fuel cell

10. For use in a hybrid power system having a battery pack and a fuel cell for supplying power to a load, a method of maintaining the battery pack's state-of-charge within a preselected range, comprising the steps of:

(A) monitoring the state of charge of the battery pack;

(B) determining the amount power required by the load;

(C) determining the amount of power being supplied by the fuel cell; and,

(D) setting the power output of the battery pack based on the power amounts determined in steps (B) and (C).

11. The method as set forth in claim 10, including the steps of:

(E) determining the maximum amount of power that can be supplied by the fuel cell; and,

(F) comparing the amount of power determined in step (C) with the maximum power determined in step (C).

12. The method as set forth in claim 10, wherein step (D) includes setting the power output of the battery pack to a first value if the power required by the load is less than the maximum power available to be supplied from the fuel cell, and setting the power output of the battery pack to a second value if the power required by the load is equal to or greater than the maximum power available to be supplied from the fuel cell.

13. The method as set forth in claim 12, wherein the first value is determined based on at least the maximum

voltage of the fuel cell, and the nominal state-of-charge of the fuel cell

14. The method as set forth in claim 12, wherein the second value is determined based on the lumped system load power and the maximum power available to be supplied by the fuel cell.

15. A method of reducing fuel consumption in a fuel cell hybrid electric vehicle having a charge carrier for supplying power to a load, comprising the steps of:

(A) determining the state of charge of the charge carrier;

(B) setting the power output of the charge carrier to a first value if the power required by the load is less than the maximum power available to be supplied from the fuel cell; and,

(C) setting the power output of the charge carrier to a second value if the power required by the load is equal to or greater than the maximum power available to be supplied from the fuel cell.

16. The method as set forth in claim 15, including the step of determining power required by the load.

17. The method as set forth in claim 15, wherein steps (A)-(B) are repeated in a manner to maintain the state-of-charge of the charge carrier within a preselected range.

18. The method as set forth in claim 15, wherein the first value is determined based on at least the maximum voltage of the fuel cell, and the nominal state-of-charge of the fuel cell.

19. The method as set forth in claim 15, wherein the second value is determined based on the lumped system load power and the maximum power available to be supplied by the fuel cell.